

CLAIMS

1. A multilayer tube comprising at least three layers including:
 - a layer (a) comprising (A) polyamide 11 and/or polyamide 12,
 - a layer (b) comprising (B) a polyamide (semi-aromatic polyamide) comprising a dicarboxylic acid unit containing a terephthalic acid and/or naphthalenedicarboxylic acid unit in a proportion of 50 mol% or more based on all dicarboxylic acid units, and a diamine unit containing an aliphatic diamine unit having a carbon number of 9 to 13 in a proportion of 60 mol% or more based on all diamine units, and
 - a layer (c) comprising (C) a fluorine-containing polymer having introduced into the molecular chain thereof a functional group having reactivity with a polyamide-based resin.
2. A multilayer tube comprising at least four layers including:
 - a layer (a) comprising (A) polyamide 11 and/or polyamide 12,
 - a layer (b) comprising (B) a polyamide (semi-aromatic polyamide) comprising a dicarboxylic acid unit containing a terephthalic acid and/or naphthalenedicarboxylic acid unit in a proportion of 50 mol% or more based on all dicarboxylic acid units, and a diamine unit containing an aliphatic diamine unit having a carbon number of 9 to 13 in a proportion of 60 mol% or more based on all diamine units,
 - a layer (c) comprising (C) a fluorine-containing polymer having introduced into the molecular chain thereof a functional group having reactivity with a polyamide-based resin, and

a layer (d) comprising (D) a terminal modified polyamide satisfying $[A] > [B] + 5$, wherein $[A]$ is the terminal amino group concentration ($\mu\text{eq/g-polymer}$) of the polyamide and $[B]$ is the terminal carboxyl group concentration ($\mu\text{eq/g-polymer}$) of the polyamide.

3. The multilayer tube as claimed in claim 1 or 2, wherein said layer (a) comprising (A) polyamide 11 and/or polyamide 12 is disposed as an outermost layer.

4. The multilayer tube as claimed in any one of claims 1 to 3, wherein said layer (b) comprising (B) a semi-aromatic polyamide is disposed between said layer (a) comprising (A) polyamide 11 and/or polyamide 12 and said layer (c) comprising (C) a fluorine-containing polymer.

5. The multilayer tube as claimed in any one of claims 2 to 4, wherein said layer (d) comprising (D) a terminal modified polyamide is disposed between said layer (b) comprising (B) a semi-aromatic polyamide and said layer (c) comprising (C) a fluorine-containing polymer.

6. The multilayer tube as claimed in any one of claims 1 to 5, wherein said (B) semi-aromatic polyamide is a polyamide comprising a dicarboxylic acid unit containing a terephthalic acid and/or 2,6-naphthalenedicarboxylic acid unit in a proportion of 50 mol% or more based on all dicarboxylic acid units, and a diamine unit containing a 1,9-nonanediamine and/or 2-methyl-1,8-octanediamine or 1,12-dodecanediamine unit in a proportion of 60 mol% or more based on all diamine units.

7. The multilayer tube as claimed in any one of claims 1 to 6, wherein said (C) fluorine-containing polymer having introduced into the molecular chain thereof a functional group having reactivity with a polyamide-based resin is based on at least one fluorine-containing polymer selected from the group consisting of an ethylene/tetrafluoroethylene copolymer, a polyvinylidene fluoride, and a tetrafluoroethylene/hexafluoropropylene/vinylidene fluoride copolymer.

8. The multilayer tube as claimed in any one of claims 2 to 7, wherein said (D) terminal modified polyamide is a polyamide produced by adding a diamine at the polymerization.

9. The multilayer tube as claimed in any one of claims 1 to 9, wherein an electrically conducting layer comprising a fluorine-containing polymer composition having incorporated therein an electrically conducting filler is disposed as an innermost layer in the multilayer tube.

10. The multilayer tube as claimed in any one of claims 1 to 9, wherein each of said layers is a coextrusion molded article.

11. The multilayer tube as claimed in any one of claims 1 to 10, which is a fuel tube.